

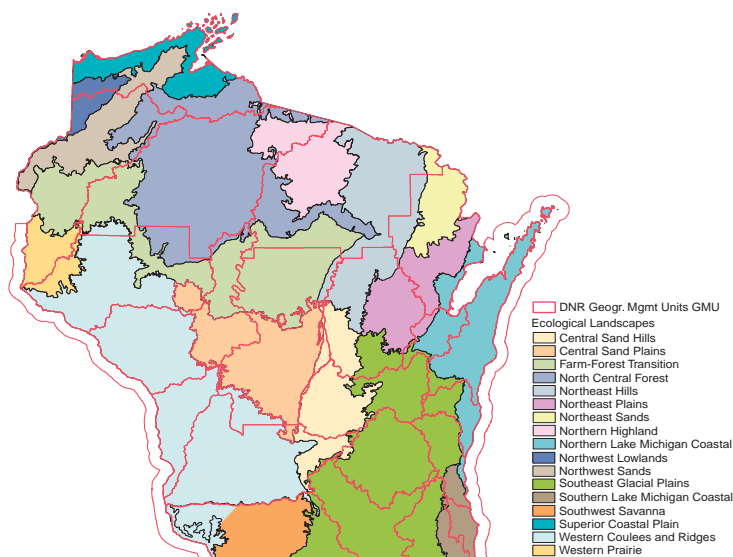
# Water Management Programs

## Water Quality Management Planning

Wisconsin's Water Quality Management Planning Program encompasses a broad array of activities, as 'basin plans' have historically served as the foundation for conformance reviews during implementation of many of the state's water-related programs, grants and permits. Water Quality Planning includes the following activities:

- Preparation of Basin or Integrated Management Plans.
- Assessment of rivers, streams, lakes and groundwater; entering data into the Waterbody Assessment Display and Reporting System (WADRS).
- Identification of areas for monitoring and management including identification of goals, objectives and projects.
- Ranking nonpoint source priority areas for streams, lakes or groundwater.
- Recommendations for specific Lake or River Planning or Protection Grants.
- Recommendations for prioritizing waterbodies for total maximum daily load (TMDL) implementation.
- Administration of the Local Water Quality Aid Program, which provides grant funds to local and regional governments for water quality management planning.
- Preparation of Sewer Service Area Plans.
- Oversight, review and approval of plans developed by designated planning agencies (Southeast Regional Planning Commission, Dane County Regional Planning Commission) and for additional designated management areas (Fox Valley Area, including Brown County and portions of East Central Regional Planning Area).
- Oversight, review and approval of sewer service area plans developed by communities with populations of greater than 10,000 – these undesignated planning areas.

Figure 4: Landscape Ecosystems



## Integrated Basin Plans

The State's 32 major rivers fall into 23 management basins. During 2000-2001, 19 of these management basins developed State of the Basin Reports through an integrated planning process with partners. This multi-step process involved external partners in the identification and prioritization of issues and to help identify goals and objectives for ecosystem management. Integrated Basin Plans (or "State of the Basin Reports") can:

- ✓ Highlight priorities identified through a partner group process.
- ✓ Provide a descriptive summary of the physical and biological characteristics of the basin;
- ✓ Identify basin-specific water, fishery, wildlife and habitat issues. and
- ✓ Identify basin-specific objectives (in the form of recommended actions) linked to the GMU or

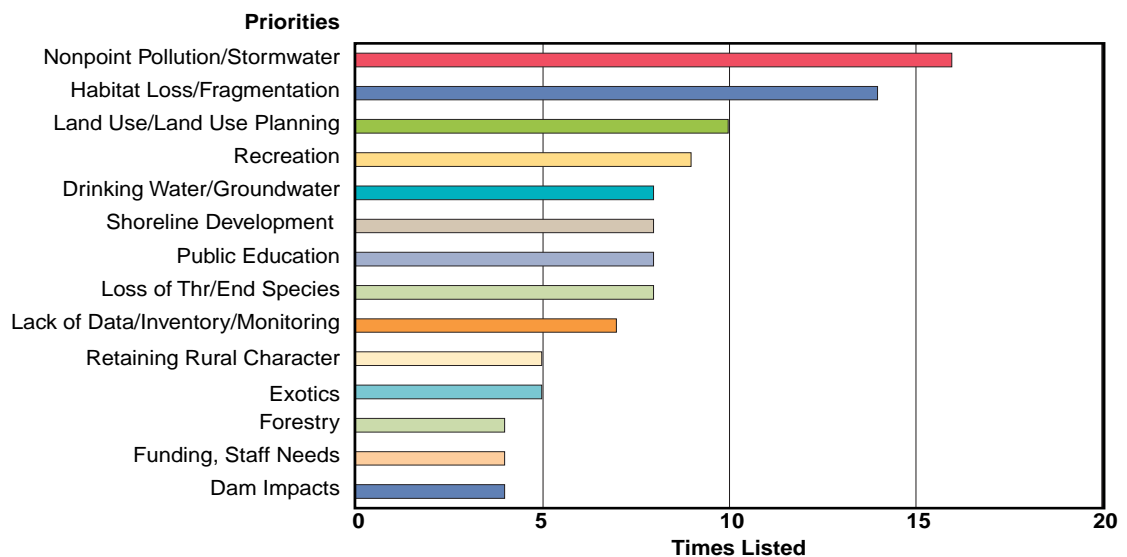
basin-specific issues.

#### Planning Status

The state's traditional planning schedule, updates on a five-year rotating basis, was replaced with a six-year schedule to support the structure of the basin-partner management approach. Through the identification of key issues, goals, objectives and recommendations, the plans provide a starting point for project identification and work coordination. This statewide schedule also coincides with DNR's internal biennial workplanning schedule and fisheries management planning approach.

The broadened scope of basin planning reflects a broadening of the state's key management issues as they relate to water. Priority issues identified in the plans are arrayed and compiled to identify the overall priorities identified at the basin level. Figure 5 shows the principle issues identified through the integrated planning process. These issues include habitat loss/land use conflicts, deterioration and fragmentation; nonpoint source pollution of surface waters; groundwater deterioration; contaminated sediments; user conflicts due to heavy recreational uses; contaminated sediments.

Figure 5: Principle Issues Identified Through Basin Planning



WDNR continues to make progress toward increasing the number of surface waters assessed for their water quality condition. This effort will be enhanced in the next year through an analysis of assessment protocols for streams, lakes and the Great Lakes and how these assessments relate to the identification of impaired waters under the Clean Water Act Section 303(d) requirements.

The primary issues for streams continue to be degraded habitat and polluted runoff. For lakes, it is Sewer Service Area Planning involves identifying a community's 20-year growth pattern to design cost-effective and environmentally sound sewerage systems. A sewer service area plan has maps of existing sewerage areas, adjacent land most suitable for new development, and areas where sewers should not go due to environmental constraints. Sewer service area planning is designed to provide structure to a community's wastewater collection system and plays an important role in keeping Wisconsin's water safe for drinking, recreation, and fish and aquatic life. Because the plans anticipate future growth they can be used as a tool to help consolidate wetland, shoreland, and floodplain protections in a community-based plan.

In "undesignated areas" (see above), sewer service plans identify future service areas for communities with populations exceeding 10,000 (as per NR 121.05(1)(g)(4)). Urban areas with wastewater treatment plants that treat 1.0 million gallons per day or more within standard metropolitan regions are included in the sewer service area planning process. There are 28 municipalities in the state that fall under this "undesignated area" definition. Most of these 28 areas have an approved sewer area

plan. Only a two communities that are required to have a sewer service area plan still do not have an approved plan.

## Water Quality Standards

In Wisconsin surface waters are classified for the beneficial uses they are capable of supporting if controllable impacts to water quality are managed. Protections afforded surface waters are derived from a series of administrative codes, ranging from ch. NR102 through NR106, Wisconsin Administrative Codes. Ch. NR 102 provides the classification of waterbodies in the state. Water quality criteria for wetlands is provided in ch. NR 103. Ch. NR 104 identifies waterbodies that have specific water quality classifications other than warm water sport fish or forage fish communities (i.e., those that are outstanding or exceptional resource waters or those that are identified as marginal (limited forage fisheries or limited aquatic life communities). NR 105 provides standards for toxic substances and NR 106 details how to calculate water quality-based effluent limits (WQBELs) to meet standards found in NR 105.

### Water Quality Classifications

NR 102 identifies water quality classifications for Wisconsin Surface Waters (see below). WDNR uses the state's fish and other aquatic life uses classification as the basis for its assessment procedures (see Chapter 2).

#### Fish and Other Aquatic Life Uses

Fish and other aquatic life uses are further subdivided in Wisconsin Administrative Code NR 102.04(3) in the following categories:

**Cold water communities:** These are surface waters that are capable of supporting a community of cold water fish and other aquatic life or serving as a spawning area for cold water fish species and includes, but is not limited to, surface waters identified as trout waters (Wisconsin Trout Streams, publications 6-3600(80)).

**Warm water sport fish:** These are surface waters capable of supporting a community of warm water sport fish or serving as a spawning area for warm water sportfish, such as bass.

**Warm water forage fish communities:** These are surface waters capable of supporting an abundant, diverse community of forage fish and other aquatic life.

**Limited-forage fish communities:** These are surface waters capable of supporting only a limited community of forage fish and other aquatic life due to low flow, naturally poor water quality, or poor habitat.

**Limited aquatic life:** These are surface waters of severely limited capacity due to very low or intermittent flow and naturally poor water quality or habitat, capable of supporting only a limited community of aquatic life.

Surface waters classified in the limited forage fishery or limited aquatic life subcategories are not capable of achieving Clean Water Act goals. These waters are listed in Wisconsin Administrative Code NR 104.05 to 104.10.

#### Outstanding & Exceptional Resource Waters

Wisconsin has classified many of the state's highest quality waters as Outstanding Resource Waters (ORWs) or Exceptional Resource Waters (ERWs). Chapter NR 102 lists the ORWs and ERWs. The identification of ORWs was one of the requirements for federal approval of the antidegradation policy. In the early 1990s WDNR conducted a statewide evaluation to determine which waters qualified for ORW and ERW classification. In 1993 and in 1996 waters were added to Chapter NR 102 as ORWs and ERWs after rigorous screening and public input processes. In 2002, the Public Service Commission donated Caldron Falls as a protected waterbody under the ORW/ERW program. Below is a summary of the number of waters that are classified in NR 102 as Outstanding and Exceptional Resource waters:

Table 1: ORW/ERW Waterbodies

	ORWs	ERWs - Number of Waters
Streams	220	1532
Lakes	97	
Flowages	6	

A total of 2,075 stream miles or 6.5% of the 32,010 perennial river miles in the state have been classified as ORW. A total of 3,661 stream miles or 12% of the river miles in the state have been classified as ERW. Of Wisconsin's 27,723 waterbodies, 1,855 (6.7%) are now classified in NR 102 as either Outstanding or Exceptional Resource Waters.

#### Recreational Use Waters

Surface waters in the fish and aquatic life use classifications may also be classified as recreational use waters. This classification assures standards protecting surface waters from fecal contamination. A bacterial examination of the water determines the suitability of a recreational use classification. As a result of this classification, municipal dischargers to recreational use waters may be required to disinfect their effluent.

#### Public Health and Welfare

All surface waters shall meet the human threshold and human cancer criteria specified in Wisconsin Administrative Code NR 105. The applicable criteria vary depending on whether the surface water is used for public drinking water supplies and the designated aquatic life use subcategory. All surface waters that provide public drinking water supplies, or are classified as cold water or warm water sport fish communities must meet taste and odor criteria as specified in NR 102.

#### Wildlife

All surface waters shall be classified for wildlife uses and meet the wildlife criteria as specified in NR 105.

### Water Quality Classification Revision Process

#### Stream Classification Revision

An extensive list of streams and their designated aquatic life uses were promulgated by WDNR in 1976. Use designations are defined in NR 102 and represent a classification system that considers the type of aquatic life community that may be supported by a surface water and its naturally occurring background chemical (i.e., dissolved oxygen, pH, etc.), physical (i.e., temperature, flow, habitat, etc.), and biological (i.e., species of fish and other aquatic life present) features.

The WDNR is currently updating the aquatic life use designations and is repackaging the rules in a more logical, user-friendly format. Streams not meeting standards for fish and aquatic life, primarily due to natural conditions, were listed in NR104 in 1976. This system allowed the establishment of effluent limits in an efficient manner while also providing a level of water quality commensurate with the economic and cultural realities. Additional streams have been evaluated and their classifications will be included in a revised NR104. In addition, many of the classifications conducted in the 1970s have been reviewed and, based on new information, need to be reclassified to another Fish and Aquatic Life classification sub-category. These changes in classification typically cause a modification in water quality criteria and associated requirements (e.g. effluent limitations for point sources).

#### Phase I: Water Body Use Designation

To properly update stream classifications, revisions to chapters NR 102, 104 and 106 are underway. The revisions will be completed in two phases. Phase I revisions focus primarily on accurately updating current classifications listed in NR 104. Use designation changes included in Phase I revision efforts should not force a wastewater treatment plant (WWTP) upgrade – these revisions are

intended to make the rule current with respect to use designations and WWTP effluent limits. The proposed revisions to each of the Natural Resource code chapters are as follows:

To learn more go to: <http://dnr.wi.gov/org/water/wm/wqs/index.htm>

**Chapter NR 102**, *Water Quality Standards for Wisconsin Surface Waters*, will contain rule language that was previously located in NR 104. NR 102 is a more appropriate location for the language since the language is specific to designated use categories and water quality criteria necessary to support those uses for the surface waters of Wisconsin.

**Chapter NR 104**, *Uses and Designated Standards*, is the chapter that establishes uses and designated standards for surface waters of the state. Surface water use designations and variances included in this chapter have been updated. Further, specific waters that may be characterized as surface waters not able to support a Full Fish and Aquatic Life community are listed in this chapter.

**Chapter NR 106**, *Procedures for Calculating Water Quality Based Effluent Limitations for Toxic and Organoleptic Substances Discharged to Surface Waters*, is proposed to be re-titled. The purpose of this subchapter is to specify how the department will determine effluent limitations for substances discharged to waters that have been identified and designated as surface waters not able to support a Full Fish and Aquatic Life community.

## Phase II: Water Body Use Designation

Phase II of the revisions will focus on further modifications to the listing of use designations in NR 104, as well as the exploration of several policy issues related to designating the use of a waterbody. Topics related to use designation have been identified that warrant additional thought and discussion. A Water Body Use Designation Advisory Committee (WBUD AC), comprised of members from the academic, environmental, and regulated community, has been charged with working through the topics. Several issues that have been identified for discussion including dealing with effluent discharges to various types of receiving waters, including cold water resources, Great Lakes waters, effluent channels and dry runs. There will also be additional research and discussion regarding how to appropriately classify wetlands to ensure that they are adequately protected from potential discharges. Finally, Phase II revisions will work through the aspects of implementation of new policy and procedure decisions into the existing use designation program. While these are some of the subjects scheduled for Phase II of the revision efforts, it should be noted that the focus of the effort might change over time, as different and/or additional needs are identified.

## Proposed Classifications

### Fish and Aquatic Life Stream Classification Guidelines

Surface water sources throughout Wisconsin vary in size, quality, and utilization, and can be grouped according to common characteristics. These groupings enable the Department to properly protect the resource while allowing the use of the resource by parties with various interests. To preserve and enhance water quality throughout the state, the following use designations have been established by WDNR: Fish and Aquatic Life, Recreation, Public Health and Welfare (including drinking water), and Wildlife. Of these classifications, the Fish and Other Aquatic Life classification is designed as a water quality management tool to qualitatively assess and designate fish and aquatic life uses for surface waters receiving waste discharges.

Within the Fish and Aquatic Life use designation, five sub-categories of uses have been proposed: Coldwater A, Coldwater B, Full Fish and Aquatic Life (FFAL), Limited Forage Fish (LFF) and Limited Aquatic Life (LAL). Minimum characteristics for each of these sub-categories are detailed in the guidance.

If there are controllable impacts on a specific waterbody that can be eliminated or reduced (e.g., point source discharges, construction site runoff, or landfill leachate), a waterbody could potentially have an improved **attainable use (currently referred to as potential use)**. The **designated (or potential) use** of a waterbody is the use that is selected and promulgated as a management goal.

When it is determined that a surface water needs to be classified (or re-classified), field data are collected and analyzed. These data include the assessment of existing information, fish communities,

habitat, water quality, and macroinvertebrates. Collected data are interpreted, compared to reference sites, and a final use designation determination is made. This use designation, once promulgated, establishes the linkage to water quality criteria that are used to manage the discharge of pollutants into the waters of the state.

### Waterbody Assessment Implications

Modifications to the system on which Wisconsin bases its aquatic life use designations demands a review and revision to the way in which the state assesses its waterbodies for the 305(b) Water Quality Assessment procedure. The current aquatic life community-based system (described in Part III, Chapter 2), which is used hierarchically to identify use support levels for state level assessments – and, which is used in conjunction with the waterbody's codified use to identify additions to the state's 303(d) list of impaired waters, may no longer be in effect once new classification rules have been promulgated. In addition, use of a random stratified sample design for the state's baseline monitoring program requires the development of protocols to assess the condition of a waterbody in light of extrapolated data rather than the use of traditional monitoring and assessment protocols. This change also demands a re-evaluation and redesign in the way streams and lakes are assessed statewide. Thus, in the coming years, WDNR's water and fisheries programs work together to evaluate potential changes in how assessments are conducted as a precursor to designing a new system for determining use designation support for waterbodies.

**Thermal Standards.** Water temperature is very important to the health, reproduction, and function of aquatic organisms and plants, as they exist only within certain temperature ranges. Water quality standards that protect aquatic organisms and plants from human discharges of elevated temperatures or heat loads (i.e. thermal pollution) are an important component of the overall regulatory strategy for protecting aquatic environments. Sources of thermal pollution include:

- industrial discharges (e.g. power plants, manufacturing plants, etc.),
- discharges from dams,
- urban runoff,
- changes in land use (e.g. loss of trees and shrubs along streams, loss of wetlands, etc.),
- and agricultural runoff.

Wisconsin continues its revision of thermal water quality rules, with rule adoption planned for 2005.

## Wastewater Management

WDNR has primary state management authority over wastewater treatment and disposal in the state. This management responsibility is accomplished through the implementation of the following programs and activities:

- Wisconsin Pollutant Discharge Elimination System (WPDES) permits program.
- Industrial pretreatment for discharges to municipal sewerage systems.
- Approval of plans for wastewater treatment and disposal facilities and practices ("facility planning")
- Enforcement and compliance assistance.
- Assuring continuing and sufficient wastewater management practices in municipalities through a compliance maintenance and reporting program.

### WPDES Permit Program

The WDNR regulates municipalities, industrial facilities and significant animal waste operations discharging to surface waters or groundwater of the State of Wisconsin through the Wisconsin Pollution Discharge Elimination System (WPDES) Permit Program (See Section on Runoff Management for discussion of WPDES permits for stormwater). No person may legally discharge to surface



waters or the groundwater of the state without a permit issued under this authority. All permits issued under the WPDES permit program are either specific permits or general permits and may contain the following:

- Effluent limits for conventional pollutants and toxic substances in the discharge,
- Limitations on the quality and disposal practices for sludge (biosolids) and by-products solids,
- Pretreatment requirements, where applicable,
- Compliance schedules for facility improvements, and/or
- Monitoring and reporting requirements.

Specific permits are issued to individual facilities. The number and type of individual permittees currently regulated by the WPDES program as of January 2004 were 663 municipal permits, 430 Industrials and 130 CAFOs. These include major and minor facilities.

General permits are issued to cover a group of facilities with similar discharges which may be located anywhere in the state. Coverage under a general permit is conferred to each individual facility. The WDNR makes a determination on whether a particular facility is appropriately covered by a general or specific permit. There are 17 general permits that may be used to cover applicable discharges ranging from non-contact cooling water to land application to non-metallic mining operations. Two-thousand facilities are covered under a general permit.

### Permit Backlog

The WDNR is not, in all instances, able to reissue permits before the 5-year term expires. The number of expired permits, however, is a small fraction of the total number of WPDES permits that are in effect at any given time. The goal of the WPDES permit program is to ensure that the Department does not exceed a statewide backlog of more than 10% at any time. As of January 1, 2004, the backlog of industrial and municipal permits, including both surface and groundwater discharges, was under the 10% goal (see below) and below that of many other states.

Under Wisconsin law, any permit that has expired continues in effect until it is reissued or revoked. Facilities with an expired permit, therefore, are restricted in the amount of pollutants they can discharge as if the permit has not expired.

Table 2. Wisconsin WPDES Permit Backlogs as of January 1, 2004

Total (minors and majors )	Expired Total	% Backlog	
Municipal	663	37	5.6%
Industrial	430	33	7.7%
(overall totals)	1093	70	6.4%
CAFOs	130	11	8.2%



Permits are not issued prior to the expiration date for several reasons including WDNR is awaiting additional data from the permittee, public or other comment necessitates additional review, rules are inadequate to address concerns with the discharge or a permittee is not in substantial compliance with the terms of the expired permit and enforcement action is underway.

In 2004 the Governor initiated a new permit tracking website for the public. It details both qualitative and quantitative WPDES permit issuance information.

## Enforcement and Compliance Assistance

The WDNR monitors permitted discharges to assure permittees are complying with the terms and conditions of their permits. This “compliance assurance process” takes several forms and includes:

Compliance maintenance—working with and assisting facilities to remain compliant.

Compliance assessment—conducting inspections of facilities and on-site assessments, reviews of discharge monitoring reports and other reports for compliance, follow-up on self-reported violations.

Enforcement—formal actions taken when a significant violation is identified including notification of a violation of a permit condition, formal enforcement conferences and/or contacts and referral to the state Department of Justice (DOJ).

Due to the excellent record of compliance of major permittees, the Department has revised its inspection strategy to allow it to focus greater attention on minor permittees who more frequently experience compliance difficulties. In June 2004, WDNR developed an updated enforcement strategy to assure there is appropriate and timely response to permit violations.

WPDES permittees have an excellent record of compliance. Table 3 shows the number of cases of significant violations identified during 1999, 2000 and 2001, along with the other formal enforcement data:

Table 3. Significant WPDES Violations

Enforcement Activity	2001	2002	2003
Number of wastewater cases referred to DOJ	9	17	10
Number of stormwater cases referred to DOJ	2	3	2

## Effluent Limitations

Each permit contains effluent limitations based on the type of facility or water quality-based effluent limitations calculated to meet water quality standards. Effluent limitations may regulate the amount of biochemical oxygen demand, suspended solids, pH, phosphorus, ammonia, chlorine, other toxic substances, or other conditions depending on the type of facility and the water to which it is discharged. The need for whole effluent toxicity testing is evaluated for permits that discharge to surface waters. Further information on the results of toxicity testing of wastewater effluents is contained in this report under Ecosystem Health Assessment. Land application systems normally regulate the amount of nitrogen, chlorides, or other materials that may contaminate the groundwater.

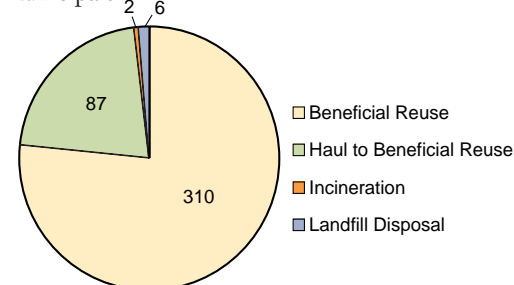
## Biosolids and Sludge Disposal

About 40 percent of the costs incurred to construct, operate and maintain a municipal wastewater treatment facility come from processing, handling and recycling the residues—the sludge or biosolids—that result from wastewater treatment. Most municipal and many industrial facilities in Wisconsin land apply their wastewater treatment sludge or biosolids on agricultural land as a soil conditioner or fertilizer. Approximately 98 percent of municipal sludge generators, for example, either ultimately apply it on farmland or distribute it for individual use. Of 406 municipal facilities which must remove sludge at least annually, 310 directly beneficially reuse it, 87 haul it to facilities who beneficially reuse it, two incinerate it, and six dispose of sludge at least part of the year in a licensed landfill.

There are an additional 243 permitted facilities which treat wastewater in lagoon systems or systems which only require removal of sludge on an infrequent basis (10 - 20 year cycles). These facilities almost universally land apply their sludge.

Regulations and permit conditions control the amount of sludge or biosolids that may be land-applied depending on the soil, slope, time of year, proximity to residences and wells and other factors. Application rates are limited to the agronomic needs

Figure 6. Disposition of Sludge Waste—Municipals





of the crop to be grown and soil analyses are required at least every four years. Phosphorus levels in sludge have increased as Wisconsin has limited the amount of phosphorus that can be discharged directly to surface water in the effluent. Therefore, sludge must be managed in a way that will keep it on the land and minimize the potential for runoff to surface waters. The state also regulates all septage pumped from 698,000 septic systems (300,000 of them on required maintenance schedules) and 30,000 holding tanks. Septage must either be taken to a wastewater treatment plant for further treatment or directly land-applied. The same site criteria apply to septage as to sludge.

## Pretreatment

Pretreatment dischargers are industrial facilities that do not discharge their wastewater directly to the waters of the state, but instead discharge into a municipal sewerage treatment plant. The WDNR has been delegated the authority to administer this federal program. Twenty-six municipal governments in the state are responsible for meeting state and federal requirements for implementation of pretreatment requirements. These "control authorities" regulate discharges to their systems through the issuance of permits and other local controls. Industrial discharges that are subject to the pretreatment requirements of the state, but are not within the systems of these municipal control authorities, must obtain permits directly from WDNR. There are a total of 165 facilities that receive permits directly from WDNR.

Over the past several years, the amount of WDNR oversight of the pretreatment program has declined substantially. This reduction is due to a variety of reasons including loss of staff to other high priority activities or budget reductions and a determination that most of the delegated municipalities are adequately implementing the program. In the past couple of years, however, the department has taken enforcement action against delegated municipalities for program violations. By implication, this indicates that the program is at a point of being so significantly reduced that it may be losing its effectiveness and relevance. The WDNR is reviewing this program to determine what actions are needed, if any, to assure the continued implementation of this program while at the same time reducing administrative overhead. In the past couple of years, the Department has added a pretreatment component to the SWAMP system, thereby enhancing program management.

## Significant Wastewater Management Policy and Program Issues

### Sanitary and Combined Sewer Overflows

In the period from 1998 through 2000, and again, in 2004, heavy rains in the Milwaukee urban area resulted in numerous incidents of overflows from the sanitary and combined sewerage systems serving the Milwaukee Metropolitan Sewerage District (MMSD) and tributary (satellite) communities. These overflow events resulted in impairments to local surface waters, and caused considerable public concern about the efficacy of these systems. In response, the Department published a report in 2001 describing the incidents and presented a lengthy series of recommendations for addressing the issue of sanitary sewer overflows in the Milwaukee area and statewide. In addition, this investigation resulted in the Department initiating an enforcement action against the MMSD for permit violations. The result of this action is the development of a stipulation requiring substantial work in the MMSD system to assure that sanitary sewer overflows are being addressed by the local governments. The Department has also initiated efforts to revise state regulations that govern the overflows from sanitary sewerage systems. In August 2004, WDNR referred to the state Department of Justice, the MMSD and 29 satellite communities for SSO violations.

### Power Plants

As in many parts of the country, projected energy shortages have been identified as a concern. In response, several independent power producers as well as traditional utilities have proposed construction of power generating facilities in Wisconsin. Most of these plants are simple cycle or combined cycle gas turbine plants that recirculate cooling water and use cooling towers. Due to recent changes in state laws regarding the siting of power plants, permit actions in response to these proposals have been elevated in priority. Additionally, the process requires substantial interaction with the project developers, and severely truncates the time scales for permit actions. As of late

2003, there were at least 5 power plant projects being reviewed by WPDES permit staff. These new projects affect the ability of the program to keep pace with the ongoing permit reissuance workload. In 2003, the WDNR established an Office of Energy to coordinate review of energy related projects. There will be a continuing workload associated with these projects for the foreseeable future.

### Chlorides

The Department adopted water quality standards and WPDES program implementation procedures in 2000. Permit applications and point sources are being reviewed for the inclusion of chloride limits and compliance schedules. Source reduction activities to effectively reduce chlorides in discharges by significant amounts are difficult to implement. Permittees continue to evaluate opportunities and impediments to chloride reduction and the Department will continue to pursue reductions wherever possible. In some instances, reductions may be technologically and economically not feasible.

### Mercury

Water quality standards and point source implementation procedures to control the discharge of mercury were enacted in 2002. This rule was necessitated by the enhancements to the analytical detection improvements and the presence of mercury at very small, but detectable, concentrations in almost all wastewater effluents. This policy establishes a system for prioritizing permittees according to their potential for detecting mercury in their wastewater effluent and, if present, requiring implementation of source reduction measures to reduce the amount of mercury in a discharge. Permittees are required to submit and implement a "pollutant minimization program" to effect technologically and economically feasible reductions of mercury in their wastewaters.

### Ammonia

Regulations were adopted establishing water quality standards and WPDES permitting procedures for ammonia in 2004. Although the Department has been regulating ammonia in many discharges since the late 1970s using a relatively consistent procedure, EPA's revision to the water quality criteria for ammonia in 1999 provided the impetus to enact rules governing the discharge of this substance. The new rules will not substantially impact whether a permittee has to replace or construct entirely new wastewater treatment facilities to attain the new standards. Rather, small changes in effluent limitations may occur and require some modifications to operations to meet the limits. One aspect of the rules is to establish a variance process that will allow wastewater stabilization lagoon systems additional time to meet the ammonia limitations. In many instances, these systems will be replaced by more complex wastewater treatment technologies with an associated increase in costs.

### Temperature

Water quality standards for temperature will be adopted in 2005. Existing standards were declared invalid for many dischargers more than 20 years ago, and the Department's ability to regulate heated water discharges is limited. Significant efforts have been made to establish scientifically valid and protective temperature criteria to protect different aquatic life communities. Temperature is a critical factor in aquatic life protection, and heated water from point source discharges must be appropriately regulated to assure protection of those organisms (see additional discussion under "Water Quality Standards").

### Waterbody Use Designations

The designated uses of waterbodies is a significant factor in establishing effluent limitations on discharges from point sources. The current system for designating aquatic life uses for surface waters is in need of review and updating. WPDES permittees may be substantially impacted by this effort and permit limits may change as use designations change or are established based on new scientific procedures and information (see additional discussion under "Water Quality Standards").

## System for Wastewater Applications, Monitoring and Permits (SWAMP)

An effective data management system is essential for managing the WPDES permit system. The System for Wastewater Applications, Monitoring and Permits (SWAMP) features a consistent permit drafting system, storage capacity for monitoring and attribute data, linkages of monitoring and compliance data to permit limits and conditions, and an ability to track compliance, enforcement and other information related to the permit.

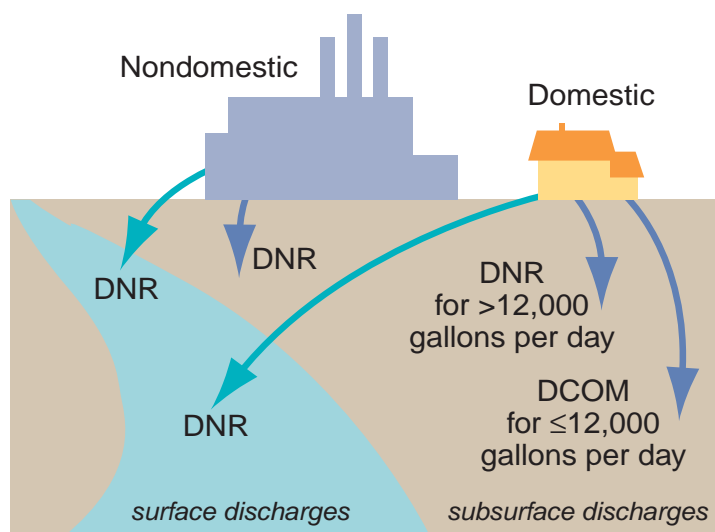
The SWAMP database was developed to provide access to monitoring, facility and inspection information, and permit drafting systems. The system was first available for use in late 1998 and additional segments and enhancements have been added as system use increased and funding became available. All permits are now being written through use of the SWAMP system, all Discharge Monitoring Report (DMR) data is being entered into the system, and it is being used by staff to assess compliance. The time needed to draft a permit has been significantly reduced as a result of the efficiencies gained through use of the system. In 2004, the Department began accepting discharge Monitoring Report information electronically for a limited number of facilities, creating further program efficiencies. It is expected that all facilities will be able to electronically submit WDNR data by 2006. Web-based permit applications are being developed now and will be online by early 2006.

Figure 7. DCOMM/DNR Wastewater Regulation Jurisdictional Boundary

## Wastewater Systems Plan Review

Wisconsin Statutes require the owners of sewerage and industrial wastewater systems to submit plans and obtain plan approval from the Department of Natural Resources for new construction or modification of sanitary sewers, wastewater pumping stations, wastewater treatment plants, large seepage storage facilities and effluent outfall sewers. Plan review is intended to be a proactive and preventive component of the Department's Watershed program, designed not only to ensure compliance with applicable regulations, but also to promote attainment of various objectives beneficial to system owners, operators, the environment, and the general public.

Plan review provides an intervention point in the wastewater treatment system planning process that promotes an exchange of information, technical assistance, coordination between owners and various agencies, documentation of sewerage system infrastructure, and development of appropriate technologies for statewide use. For major projects, plan review includes an evaluation of project environmental impacts and an opportunity for public input.



## Privately—Owned Onsite Wastewater Treatment Systems

The Wisconsin Department of Commerce (DCOMM) has authority to review and approve installation of wastewater treatment systems that use subsurface disposal for the wastewater. These are normally in the form of septic tanks and drain fields, although DCOMM has adopted new rules in early 2000 that allows the use of alternative treatment methods prior to disposal into the subsurface systems. WDNR regulates facilities greater than approximately 12,000 gallons per day, and DCOMM has the review and approval authority for smaller systems (see Figure 7). WDNR began to issue WPDES permits for large new and replacement systems in 2000. WDNR additionally retains review authority for all sizes of systems that contain and are used for the disposal of non-domestic wastewa-

ter. Some of these systems fall within the regulatory authority of Class 5 Injection wells under the Safe Drinking Water Act and are reviewed to conform to those regulations.

To learn more go to: <http://dnr.wi.gov/org/water/wm/ww/>

## Permit Program Policy Initiatives

The following policy initiatives have been underway in 2002-2004:

- Incorporating new requirements for Mercury and Ammonia into permitting and SWAMP,
- Incorporating new requirements for Confined Animal Feeding Operation (CAFO) permits into permitting and into SWAMP,
- Upgrading capabilities for automatic generation of CAFO inspection reports in SWAMP,
- Incorporating the capability to track pretreatment facilities in SWAMP, and
- Updating geographic data reference fields in SWAMP to reflect GIS data standards at the WDNR.
- Creating electronic guidance and documents ("EGAD"), an intranet database so all policy, guidance and rules are located in one place

## Innovation in Pollution Reduction

The Bureau of Cooperative Environmental Assistance works primarily with the industry regulated community to implement activities through innovative, non-regulatory programs. The following examples apply to industries within the WPDES program:

- An Innovation Stakeholders Group has been convened as an informal, quarterly forum of business, consulting, government, environmental and academic leaders for the exploration of environmental, economic and social issues associated with environmental regulation.
- WDNR has been using environmental management systems for the past five years as a part of enforcement settlements, compliance strategies and "beyond compliance" programs.
- Three ongoing programs address environmental performance within industry sectors including the Pollution Prevention Partnership (Paper), 5 Star Program (Dry Cleaners), and Environmental Excellence Award (Asphalt Pavers).
- Recognition awards are provided through the Federation of Environmental Technologist's "Governor's Environmental Excellence Awards" and the Wisconsin Manufacturers and Commerce "Business Friend of the Environment" award.
- The Environmental Cooperation Pilot Program (Program) has allowed seven participating companies, the Department and the public to implement regulatory streamlining, energy reductions, emissions reductions, and materials reuse and recovery.
- A Permit Primer was created as an interactive web tool for managing the full scope of permitting and prevention strategies to avoid the need for permitting or reduce permit requirements for new and expanding businesses.
- The Dairy Gateway project (building a sustainable dairy agriculture region) and the Community Mercury Reduction program are using the strength of community participation and building networks to achieve better environmental results than would be achieved through traditional regulatory approaches.
- The Wisconsin Pollution Prevention Partnership Web site (<http://wip2.uwex.edu>) is a jointly maintained site with resources, contacts and links to pollution prevention activity affecting all media.
- A full-scale strategy is being implemented for the reduction in mercury containing products, reductions in air emissions (voluntary and rule based) and the community mercury reduction program to prevent mercury in wastewater.
- Legislation (Environmental Results Act or "Green Tier") has been enacted to provide an opportunity that combines growth and environmental improvement, but also for a program that can build new and better working relationships with businesses, communities and environmental groups. The legislation also provides the potential for new frameworks to make compliance strategies more effective, administrative burden more manageable and administrative direction more focused on significant environmental problems.

- The Regulatory Reform Act of 2004 contains additional provisions on permit reporting requirements that in the view of industries and others, should improve efficiency and effectiveness of WDNR's programs. Parts of this legislation contain additional requirements relating to impacts on regulated entities that need to be fulfilled when enacting rules.

## Management of Polluted Runoff

Control of polluted runoff continues to be one of the most significant challenges in the state's effort to protect the quality of Wisconsin's water resources. Urban and rural land use activities are the source of runoff pollutants entering Wisconsin's lakes, streams, wetlands and groundwater. Common pollutants in runoff include the following:

- Sediment from construction sites, croplands, and other urban and rural sources,
- Nutrients and pesticides from both urban and rural sources,
- Oil, grease, heavy metals, and other toxic materials from impervious surfaces such as streets, highways, roof and parking lots, and
- Farm animal wastes from barnyards and pet wastes from urban areas.

The effects of polluted runoff can be seen in degraded fish habitat, fish kills, nutrient-loaded waters causing heavy weed growth, degradation of drinking water supplies, siltation of harbors and streams, diminished recreational uses, and changes in the natural hydrology of streams, rivers, and lakes.

To address these pollutant problems, water quality managers encourage landowners and municipalities to implement and install "best-management practices" (BMPs) in rural and urban areas. BMPs, such as buffer strips, nutrient management, manure storage facilities, or detention ponds, help to prevent movement of pollutants to surface water and groundwater.

The state's efforts to restore water resources affected by polluted runoff center around Wisconsin's runoff management program. The WDNR worked with state agencies, local governmental units and the affected publics to develop the redesigned runoff management program. The program redesign is embodied in nine administrative rules promulgated in October 2002, eight to be administered by the WDNR and one to be administered by the Department of Agriculture, Trade and Consumer Protection (DATCP).

Three primary components of the WDNR's runoff management program include the implementation of the three runoff management grant programs, point source permitting of storm water and agricultural runoff sources, and implementation of state regulatory performance standards. The management strategy for these programs is aimed at abating urban and rural polluted runoff. Wisconsin has been recognized as a leading state in the effort to control polluted runoff.

The runoff management program is a joint effort of the WDNR, the DATCP, county Land Conservation Departments (LCDs), and municipalities, with assistance from a variety of federal, state, and local agencies, particularly the USDA Natural Resources Conservation Service (NRCS) and the University of Wisconsin-Extension.

### Priority Watershed/Lake Program

The Priority Watershed/Lake Program provides financial assistance to local units of government in selected watersheds to address land management activities, which contribute to urban and rural runoff. The WDNR issues grants for the implementation of watershed/lake projects through a cost-share approach. The grantees use the funds to reimburse costs to landowners for installing voluntary BMPs. From the start of the program in 1978 through December 31, 2003, approximately \$175 million in cost-share grants has been provided to these priority watershed/lake projects.

Since the program began, 86 of the state's watersheds and lakes were designated as priority watershed or lake projects (see Figure 8). Thirty-eight (38) of the 86 projects have been closed or completed. All of the remaining projects have been approved and are in the implementation phase.

Priority watershed/lake project goals focus on water quality improvements or protection resulting from reductions in pollutant levels delivered to streams, rivers, and lakes. Annual report data for 2002 indicate that projects are making progress towards reducing phosphorus from barnyards and upland



sediment/soil loss. Approximately 68 percent of the projects are meeting their barnyard phosphorus reduction goals by 50 percent or more. Fifty-four (54) percent of the projects are meeting their upland sediment/soil loss reduction goal by 50% or more. In 2002, 17 projects reported a cumulative total of 325,815 feet of streambanks or shorelines that were stabilized, and a lake project reported 75,700 square feet of shoreline erosion control established. Nineteen (19) of the 40 projects that set streambank or shoreline erosion control goals are meeting them by 50% or more.

Act 27, passed in 1997, created new competitive funding programs open to applicants statewide (see below), rather than just priority watersheds/lakes. Funding for ongoing watershed and lake projects will continue through 2009; no additional projects will be funded.

### Additional Runoff Management Grant Programs in Wisconsin

The Wisconsin Legislature created two additional grant programs, the Targeted Runoff Management and Urban Nonpoint Source and Storm Water Grant Programs, to further address the effects of polluted runoff statewide. Both programs, administered by WDNR, provide competitive financial awards to control polluted runoff. Grant applications are scored based on fiscal accountability, cost effectiveness, water quality, extent of pollutant control, extent of local support and likelihood of project success. The funded projects are site-specific, generally smaller than a sub-watershed, and are targeted at high-priority resource problems.

#### Targeted Runoff Management Grant Program

The Targeted Runoff Management (TRM) Grant Program provides financial assistance to rural and urban governmental units. The maximum cost-share rate available to TRM grant recipients is 70 percent of eligible project costs, up to a maximum of \$150,000 (total state share). Local governments that are awarded TRM grants may use the funds on lands they control or make the funds available to private landowners. To date, TRM grants have funded construction of rural and urban best management practices. The projects last from two to four years. Please refer to Table 4 for additional information regarding the TRM grant projects. Since 1999, 47 agricultural and 46 urban projects have been funded by TRM grants. Approximately \$8,818,186 was authorized to fund these projects. Thus far, 41 of the 93 projects have been completed.

#### Urban Nonpoint Source and Storm Water Management Grant Program

The Urban Nonpoint Source and Storm Water Management Grant Program provides funding to urban areas with a population density of 1,000 people per square mile or greater, where there is a commercial land use, or non-permitted privately-owned industrial land. Recipients can receive 70 percent cost share for storm water planning, informational and educational activities, ordinance development and enforcement, training and design. Eligible best management practice construction costs (ie., detention ponds, streambank stabilization, shoreline stabilization) and are cost-shared at 50 percent. The funded projects last between two to three years. Since 2000, \$18,890,795 has funded 71 planning and 73 design/construction projects (Table 4).

#### Storm Water Management

WDNR regulates storm water discharges through NR 216, Wis. Adm. Code, through three categories of storm water discharges – municipal, industrial and construction sites. WDNR has issued permits to 32 Municipal Separate Storm Sewer Systems (MS4s), and has 40 additional MS4s in the application process. Revisions to ch. NR 216 to reflect phase II of the federal law were sent to the State legislature for review in March 2004. Approximately 250 MS4s, including cities, villages, towns, counties and state and federal institutions, will need permits once the Phase II regulations are implemented.

Most sediment entering urban lakes, streams, and wetlands originates from construction sites. The amount of sediment that comes off a construction site per acre is generally an order of magnitude greater than the amount that comes from agricultural cropping practices. Construction site pollutants include sediment, nutrients (phosphorus and nitrogen), heavy metals, oil, and grease. WDNR permits 500 new construction sites each year for sites disturbing five or more acres of land. Phase II storm water regulations will require construction sites one acre or more land disturbance to

obtain permit coverage and there are estimated to be 3,000 to 4,000 construction sites that will require permit coverage annually in Wisconsin.

Approximately 5,800 industrial facilities are covered under a WPDES storm water general permit. The WDNR has issued six general permits to cover storm water discharges from industrial facilities. Three of these permits were drafted specifically to cover one type of industry each, namely scrap recycling, used auto parts recycling, and non-metallic mining facilities. The scrap and auto parts recycling permits include the option for a facility to join a Cooperative Compliance Program (CCP). A CCP is an organization that provides additional training and auditing of its members and provides compliance reports to the WDNR. More than 60% of permitted facilities have voluntarily joined a CCP, and those facilities have done substantially better at maintaining compliance than the non-CCP managed facilities. Thus, the CCP has been successful in its first 4 years of operation.

Table 4. Targeted Runoff & Stormwater Grants

CY 2001				CY 2002		
Grant Type	Grant Funds	# of Projects	# Completed	Grant Funds	# of Projects	# Completed
Agricultural	\$466,361	4	2	\$1,423,924	12	8
Urban	\$564,350	4	2	\$512,670	8	4
<b>Subtotal</b>	<b>\$1,030,711</b>	<b>8</b>	<b>4</b>	<b>\$1,936,594</b>	<b>20</b>	<b>12</b>
SW Planning*				\$952,950	19	8
Design/Const.**				\$5,861,917	28	8
<b>Subtotal</b>				<b>\$6,814,867</b>	<b>47</b>	<b>16</b>
CY 2003						
Grant Type	Grant Funds	# of Projects	# Completed			
Agricultural	\$1,703,370	19	4			
Urban	\$664,750	12	0			
<b>Subtotal</b>	<b>\$2,368,120</b>	<b>31</b>	<b>4</b>			
SW Planning*	\$1,252,630	21	0	* stormwater planning		
Design/Const.**	\$2,067,480	20	2	** Design and Construction		
<b>Subtotal</b>	<b>\$3,320,110</b>	<b>41</b>	<b>2</b>			

Indicator of stream quality: Ash  
Creek Macroinvertebrate Sample



## Non-Agricultural Performance Standards

To learn more go to: <http://dnr.wi.gov/org/water/wm/nps/index.htm>

On October 1, 2002, Wisconsin promulgated non-agricultural performance standards under ch. NR 151, Wis. Adm. Code.

The performance standards apply to construction site development and post-construction management of storm water runoff as well as runoff pollution from transportation facilities, including highways, railroads, and airports. To the maximum extent practical and by design, the construction performance standard requires an 80% control of sediment. The post-construction standards are also by design with an 80% total suspended solids control to the maximum extent practicable. Additional requirements include buffers for streams, lakes, and wetlands, peak flow control, and infiltration where feasible and so that groundwater is protected from potential contamination. Chapter NR 151 also includes total suspended solids controls for permitted MS4 facilities and general information and education requirements for all urbanized areas. The transportation performance standards generally parallel the non-agricultural performance standards. Wisconsin contractors are now required to provide long-term post-construction storm water controls in addition to controlling runoff during construction.

### Model Ordinances for Storm Water Management

Implementation of non-agricultural performance standards by cities, counties, towns, and villages will be critical to achieving water quality goals. Although the state has ultimate authority for enforcing these standards, local regulation will greatly enhance their implementation. The WDNR has developed two model ordinances to help assure statewide consistency in storm water regulations. One ordinance covers regulation of construction site erosion, the other post-construction storm water runoff. These ordinances are included in ch. NR 152, Wis. Adm. Code. The performance standards contained in these ordinances are consistent with the non-agricultural performance standards contained in ch. NR 151, Wis. Adm. Code. Adoption of either ordinance by a local governmental unit is voluntary, although the department strongly encourages that any local regulation be at least as stringent as the state's performance standards. The WDNR makes these ordinances available to local governments and provides assistance to local governments that wish to use the models as a basis for local regulations.

## Agricultural Runoff Management

Approximately 38,000 active livestock operations exist in Wisconsin. Manure from livestock operations contains organic materials, nitrogen, phosphorus and other water pollutants. Through WPDES permits issued under ch. 283, Wis. Stats., and ch. NR 243, Wis. Adm. Code, the WDNR has helped to avoid many water quality impacts from larger-scale livestock operations. In addition, the WDNR has used the Notice of Discharge (NOD) program under ch. NR 243, Wis. Adm. Code, and the agricultural performance standards and prohibitions promulgated in ch. NR 151, Wis. Adm. Code, in October 2002 to address water quality impacts from many smaller-scale livestock operations in the state.

### WPDES Permits

Water quality concerns associated with livestock operations with 1,000 animal units (AU) or more (also referred to as Concentrated Animal Feeding Operations or CAFOs) are addressed through the WPDES permit program. One thousand (1000) AUs are approximately equal to 700 milking cows, 1,000 beef cattle, 2,500 swine or 55,000 turkeys. These operations are required to obtain a WPDES permit that addresses storage, runoff, and land application of manure and other process wastewaters from these operations. There are about 126 CAFOs permitted under the WPDES program. (NOTE: one individual permit covers approximately 50 poultry operations owned or operated by the same company.) The WDNR has experienced a significant increase in the number of operations applying for permits in recent years, especially in the dairy sector. The WPDES permit program meets or exceeds federal NPDES requirements for livestock operations with 1,000 AUs or more, particularly in the areas of addressing groundwater quality impacts. USEPA recently revised its regulations for

CAFOs, and Wisconsin is in the process of modifying ch. NR 243, Wis. Adm. Code, to reflect changes at the federal level. To this end, WDNR formed an advisory committee to provide input on revisions to ch. NR 243, which are expected to be complete by the spring of 2005.

#### Addressing Water Quality Impacts from Operations with Fewer than 1,000 AUs

WDNR regulates livestock operations with fewer than 1,000 AUs that have discharges that significantly affect water quality through the Notice of Discharge (NOD) Program. In addition, under ch. NR 243, operations with 301 to 999 animal units that have discharges that meet the federal definition of a "point source" are also required to apply for a WPDES permit. With the promulgation of agricultural performance standards and prohibitions under ch. NR 151 (described below), the WDNR has an additional tool to address impacts from smaller-scale livestock operations as well as impacts from crop production. The statutory authority under ch. 281, Wis. Stats., and the creation of ch. NR 151 also provide local governments (e.g., towns and counties) the authority to enforce agricultural performance standards and prohibitions.



#### Notice of Discharge

NODs may be issued to smaller-scale livestock operations if an on-site investigation reveals the presence of a discharge to waters of the state. Technical assistance to control the discharge is typically available through the county Land Conservation Departments (LCDs) and cost-share financial assistance can be obtained through local, state and federal cost-share programs. If the water quality impact is not the result of a discharge that meets the federal definition of point source, cost sharing must be provided to cover at least 70 percent of eligible costs. Throughout the process of addressing impacts identified in an NOD, WDNR may conduct follow-up investigations to monitor compliance. A livestock operator who fails to implement necessary corrective measures within a specified timeframe is subject to a loss of cost-share funding and may be required to obtain a WPDES permit from the WDNR. Historically, the NOD program has been based on citizen complaints against livestock operations. The WDNR has changed to a targeted approach, investigating impacts from livestock in areas draining to Impaired Waters (Clean Water Act Section 303(d) waters) and high quality waters (Outstanding and Exceptional Resource Waters) instead of relying solely on citizen complaints.

Six NODs were issued during the 2002-2003 time period. For all NODs where cost sharing was provided, the average grant amount was approximately \$20,000 with a range of \$144 to \$179,121. About 55 percent of the livestock operations that received NODs from the WDNR received cost-share grants. Most livestock operations that received funding corrected their problem. About nine percent of the livestock operators failed to take required actions under the NOD and have been issued WPDES permits or have a WDNR enforcement action pending.

#### Agricultural Performance Standards and Prohibitions

The WDNR, in consultation with the DATCP, codified statewide performance standards and prohibitions for all agricultural operations in ch. NR 151, Wis. Adm. Code. These include standards for sheet, rill and wind erosion; manure storage and clean water diversions; and four manure management prohibitions (no overflow of manure storage facilities; no manure stacking near surface waters or on porous soils; no direct runoff from barnyards/feedlots to waters of the state; and no unlimited livestock access to water of the state). These standards and prohibitions are intended to occur through county Land Conservation Departments for crop producers and livestock operators with fewer than 1,000 AUs. Since promulgation of ch. NR 151, the WDNR has issued three notices of noncompliance with state standards and prohibitions.



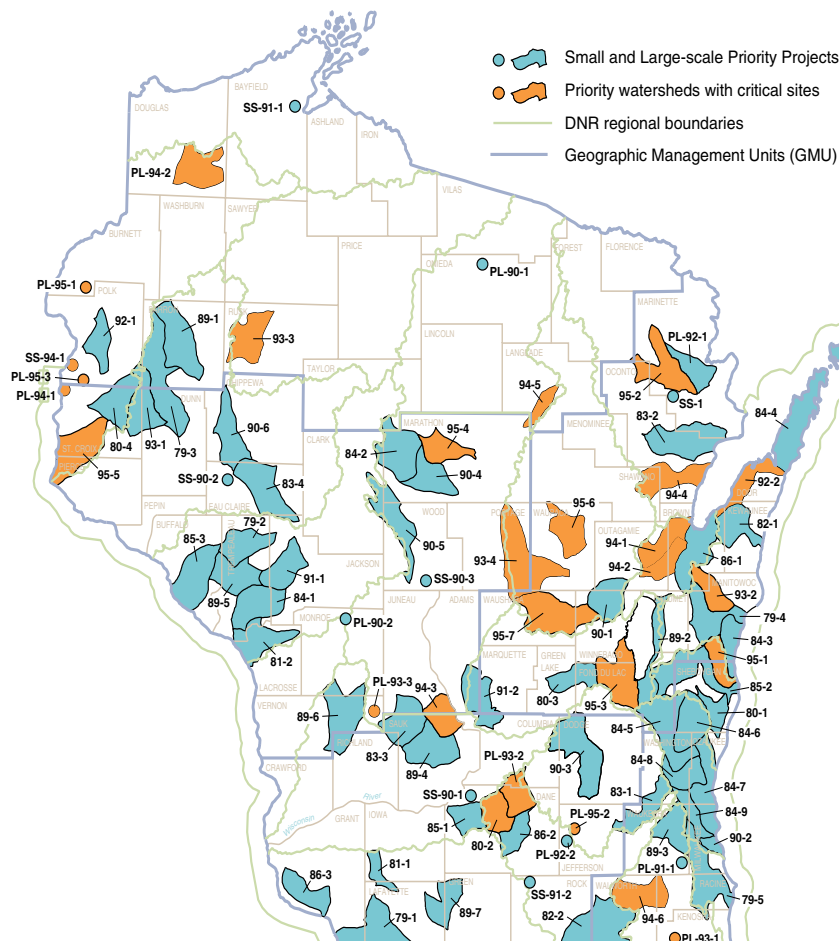


Figure 8 Priority Watershed Projects

## Financing Compliance with Performance Standards

The total estimated annualized cost to implement the performance standards is \$92 million. The estimated portion for state government is \$22 million (24%), for local government is \$46 million (50%) and for private landowners and operators is \$24 million (26%). The majority of the local government and private sector costs are associated with meeting the non-agricultural performance standards. Sources of government funds include state bonding, segregated and general purpose revenue sources for cost-sharing and local staff, the state clean water revolving loan fund, federal programs, including EQIP, CRP, CREP and section 319, and local funding sources, including county cost-share programs and storm water utilities. These funds are needed to meet standards across the state, including waters listed as impaired on the Clean Water Act Section 303(d) list.

## Dam Management

Wisconsin's 3,500 dams have a significant impact on the state's river systems. Many dams in Wisconsin served useful purposes, ranging from the generation of power to supporting recreational opportunities. Responsible individuals or municipalities own the vast majority of these dams. When faced with a decision to repair or reconstruct a dam, owners are always provided with a range of options, including removal. WDNR does not issue orders to remove a dam in situations where owners want to repair a failing structure and have the financial capability to do so. In selected cases the WDNR advocates for removal of a dam or may establish financial incentives to facilitate removal.

Dams can also cause water level fluctuations, changes in water temperature and oxygen levels, sedimentation leading to inhibition of fish movement, habitat loss, and fish mortality. Under the authority of Chapter 31 created in 1917 under the Water Power Law, the state has responsibility for and oversight of

- Dam permitting
- Dam safety, construction, operation and maintenance
- Alteration or repair of dams
- Dam transfer and dam removal
- Water level and flow control



## Dam Safety

Wisconsin's Dam Safety Program was developed under Chapter 31 to ensure that dams are safely built, operated and maintained. Three state Natural Resources regulations provide structure to the program. NR 333 provides design and construction standards for large dams, NR 335 covers the administration of the Municipal Dam Repair and Removal Grant Program, and NR336 covers the administration of a new grant program to remove small or abandoned dams.

The authority under Chapter 31 includes approval of plans for dams, alteration or additions to an existing structure and removal of a dam. Chapter 31 requires the owner of a dam to operate and maintain their dam in a safe condition. The owner can initiate repair, reconstruction or removal actions. However, dam removal is more frequently the result of a failure or of an inspection finding significant defects requiring major repairs.

## Dam Removal

The decision to remove a dam is primarily an economic decision made by the dam owner. Dam removal, which requires WDNR approval, must follow specific guidelines to assure protection of life, health, and property, as well as the surrounding environment. Chapter 31 requires the WDNR

to inspect all of the large dams in the state at least once every 10 years. Approximately 1,130 of the state's dams are classified as large dams, which are over six feet high and impound more than 50 acre-feet of water or they are 25 feet or more in height and impound more than 15 acre-feet of water. If these dams fail, they can cause loss of life or significant property or environmental damage.

In the last 20 years, over 50 dams have been removed from the state's waterways. Most of these were economic-based decisions made by the dam's owner or were abandoned dams where a responsible owner could not be found. There is a growing awareness of the negative affects dams can have on river ecosystems. Where dams have been removed, significant improvements have been noted in water quality, habitat and biodiversity at many of these sites. In recent years, the DNR has been more proactive in discussing potential habitat and water quality benefits from dam removal. Integrated management plans (see Chapter 3: Rivers and Streams) identify rivers that would benefit from dam removal in a given basin. WDNR has worked with partners to advocate for the removal of a dam or helped establish financial incentives to facilitate removal. See Chapter 3 for case studies on dam management and removal.

To learn more go to: <http://wi.dnr.gov/org/water/wm/dsfm/>

## Dam Relicensing

The Federal Energy Regulatory Commission (FERC) is responsible for licensing the state's hydropower plants and reviews the 30- to 50-year-old leases to ensure that they meet federal regulations for safety and resource protection. Since 1993, 55 licenses have expired in the state, with 17 of those between 1998 and 2001. Most facilities operate under interim annual licenses until FERC completes its reviews.

DNR is actively involved in the FERC relicensing. The Department's regulatory role was expanded through Federal court cases to require facility receipt of a State water quality certification under Section 401 of the Clean Water Act. FERC facilities must evaluate both direct and indirect impacts to water quality, reflecting a recognition of the role of nearby land use on water quality, for example. Issuing a Water Quality Certification requires the applicant to conduct studies and provide information about intentions concerning anticipated changes in land use of owned properties near the dam and reservoir. Utilities often own substantial acreage of wild and scenic property adjacent to the dam and reservoir.

### Preparing a Land Use Position Paper Related to Transfer of FERC facility lands

In 2001, WDNR prepared an issue paper regarding sale of FERC owned properties. Licensed hydropower facilities in Wisconsin and nationally have increasingly made requests to the FERC to sell land or change land use within project boundaries. Much of this land is wild, scenic and undevel-

oped and contributes to maintenance of high quality surface water resources. Although utilities can realize additional income and reduced long-term maintenance costs through land sales, those that result in subsequent development can have substantial impacts to the quality of lakes and rivers. The impacts of property sales are site specific and in fact may include cases where a land sale may be compatible with the Department's local land management interests.

There should be individual analyses of proposed land use changes in light of state land acquisition plans and license conditions. Further early coordination work among regional staff can help determine where hydro project lands overlap planned state land acquisitions, which can then be followed by legal intervention or acquisition.

Unless protected land use is guaranteed, the Department should oppose FERC approval of hydropower facility property sales or changes in land use. By analyzing public benefits (using current land acquisition plans) the Department can decide on a case-by-case basis, the best course of action.

#### Issuance of Run of River Guidance

In 2001, WDNR issued guidance to manage the concept of Run-of-River flows. Under Section 31.02, Wis. Stats., the Department may regulate and control the level and flow of water for dams on navigable waters. Pursuant to Section 401 of the Clean Water Act and under Wis. Admin. Code NR 299, Water Quality Certification (WQC) authority, the Department may also regulate flows and water levels on FERC licensed hydroelectric dams. The guidelines are designed to help assure consistent regulation of run-of-river operations were appropriate and provide s training tool for new staff and interested parties.

In most cases, a run-of-river operating mode should be used to minimize disruptions to natural river flows. At all times there must be water flowing from the dam (includes powerhouse, spillway or diversion channel) so that at any time, outflowing water equals inflowing water into the reservoir.

## Contaminated Sediment Management Program

Contaminated Sediment Management in Wisconsin involves a multidisciplinary approach within the Department and coordination with and other state and federal agencies and private partners. The goal of the program is to restore surface waters to assure the applicable water quality standards are achieved where resource uses have been impaired by the presence of contaminated sediments. Managing contaminated sediments and floodplain soils associated with Wisconsin's inland and Great Lakes waters is a multi-program effort within the Bureau of Watershed Management and other Bureaus, such Remediation and Redevelopment. The integrated work of the scientists and engineers involved is designed to:

- Develop a consistent and holistic contaminated sediment strategy,
- Integrate contaminated sediment issues with other program efforts,
- Ensure consistency in evaluating and assessing contaminated sediment sites, and
- Ensure current and applicable technology is used in remediating sediment sites.

### Key elements of the integrated effort

Key elements of the integrated effort for managing contaminated sediments include:

- Evaluation, development, and application of appropriate sediment quality assessment tools that will yield a weight-of-evidence approach to demonstrate actual or potential effects to biota including humans from contaminated sediments.
- Development of site-specific sediment quality objectives to be used with other balancing factors in making management decisions at contaminated sediment sites, applying controls on wastewater dischargers, and abating discharges from non-point sources to surface waters.
- Understanding and integrating sediment issues into various regulatory programs such as Superfund, RCRA (Resource Conservation and Recov-

To learn more go to: <http://wi.dnr.gov/org/water/wm/sed/>

ery Act), and State Environmental Repair Program sites (includes Manufactured Gas Plant Sites) and other programs including Great Lakes Remedial Action Plans.

- Maintaining a statewide sediment data base from all sediment related sampling projects.
- Developing, maintaining, and updating a statewide inventory of sites with contaminated sediments, floodplain soils, and wetland soils.
- Development of a site ranking and prioritization system to be used in the decision making process for selection of contaminated sediment sites for remediation based on available funding and resources.
- Investigating remedial and treatment technologies including dredging, capping, in situ and ex situ treatment, and handling and disposal of sediments.

While many sediment projects are large-scale endeavors, many smaller scale projects are ongoing throughout the state. The state has established a Contaminated Sediment Standing Team — CSST to develop guidance, provide technical guidance, and to communicate with the Regional offices pertaining to sediment management. This work includes standardization and implementation of policies, procedures and guidance for identification and inventory of sites, assessment of environmental and human health impacts, and enhancement of water quality in Wisconsin's surface waters through various remedial techniques. During 2002-2003 the CSST worked on further developing its website and refining a GIS-based data layer with the location of and information on each of the ongoing sediment projects in the state. In addition it is developing consensus-based sediment quality guidelines and assessment procedures to address contaminated sediment issues for dredging sites. In 2004, the Watershed Bureau has established a Sediments Section to take the lead on contaminated sediment issues.

## Impaired Waters Program

In 1998, as required under the provisions of Section 303(d) of the Clean Water Act, the Department submitted to EPA for approval a list of surface waters considered impaired. This list of impaired waters was subsequently approved with a small number of additions. DNR's vision is that each waterbody on the 303(d) list will be validated through monitoring; restored where best management practices or other management efforts can be implemented; and the waterbody removed from the list. One of the available actions is the development of Total Maximum Daily Load (TMDL) analyses. Because many of the waters on the list are impaired by complex, multi-source problems, restoration of the waterbodies will happen over an extended period of time. Wisconsin's 1998 list of impaired waters contained 552 waters, which includes rivers, lakes and river segments, harbors and bays. For purposes of management, the waterbodies are placed into the following categories based on cause of the impairment:

- Contaminated sediment – 63 waters
- Nonpoint source dominated – 170 waters
- Point source and nonpoint source blend waters – 74 waters
- Point source dominated – 2 waters
- Physical habitat – 12 waters
- Other (or multiple) – 32 waters
- Atmospheric Deposition (mercury or other toxics) – 241 waters

## Clean Up Progress - A Categorical Approach

Since 1998, Wisconsin has made progress in water quality cleanup relating to a number of these categories. For contaminated sediment waters, the Department will pursue "de-listing" the Bay Shipping Building site in Sturgeon Bay and the Fountain City Bay Boatyard in the Mississippi River due to successful contaminated sediment removal projects. In addition, removal of contaminated sediment has taken place as part of the Hayton Area Remediation Project along Jordan Creek and in Wausau along the Wisconsin River. Remediation plans have been developed for the

To see the list of 303(d) waters, go to: <http://wi.dnr.gov/org/water/wm/wqs/>

#### Lower Fox River and Sheboygan River.

For nonpoint source dominated waters, Spring Creek in Rock County was “de-listed” in 2003 due to a substantial improvement in the stream and fishery resulting from a small-scale priority watershed project. In addition, a TMDLs have been approved for 18 other waterbodies listed for either sediment or phosphorus. Also, ongoing priority watershed project implementation has been taking place in watersheds draining to 57 waters on the 1998 impaired water list.

For point source and nonpoint source blend waters, many of the waters are receiving reduced phosphorus loads due to the requirement for phosphorus removal at municipal and industrial wastewater treatment plants under the provisions of Chapter NR 217, Wis. Adm. Code. For the nonpoint source portion of these blend situations, ongoing priority watershed project implementation has been taking place in watersheds draining to 22 waters on the 1998 impaired water list.

For the nonpoint source dominated, point source and nonpoint source blend and certain of the “other” category waters, in late 2001, Wisconsin began implementing the Conservation Reserve Enhancement Program (CREP). CREP is targeted towards establishing vegetated, riparian “buffers” along more than 95% of the impaired waters in these categories.

Progress in the other categories is limited. For the point source dominated waters, it appears that the impairments are likely due to past discharges and current discharges are not causing further degradation of the receiving waters. For the physical habitat category, removal of three dams on the Baraboo River will result in that segment of water being “de-listed” in the future. For waters with fish consumption advisories resulting from atmospheric deposition of mercury, progress will depend largely on reduction in air emissions of mercury both in Wisconsin and outside of the state. The Department is working with the Environmental Council of States and EPA and others to identify the best approach to address air emissions causing water impairments.



### TMDL Monitoring and Modeling

Technical guidance for developing a total maximum daily load (TMDL) allocation has been developed based on a three-tiered approach: simple, intermediate and complex. Monitoring methods have been identified to provide a basic framework to assist staff in developing an integrated approach for TMDL development and work planning. Monitoring options were developed based upon staff experience working on these types of projects; however, each situation requires independent evaluation and adjustment based on site-specific conditions. The WDNR's TMDL Monitoring and Modeling Technical Guidance Document (2001) identifies pollutants to be monitored, sample collection, duration and frequency. The document also identifies suggested station locations for monitoring based on the type of model used and other factors. Model selection is also based on this tiered approach. Project specific issues to be considered in determining the appropriate resource level of monitoring and modeling would include:

- Regulatory implications for dischargers.
- Input from interested stakeholders.
- Financial and work load resources.
- Accuracy needs.
- Knowledge and types of pollutant sources.
- Size of the water body/watershed.